

REMARKS

Status of claims

Applicants thank the Examiner for the consideration given to the present application. Claims 37-50 were previously withdrawn without prejudice due to a restriction requirement and claim 2 was previously canceled without prejudice. Claims 1, 19, and 29 have been amended to correct some informalities. As a result of this amendment, claims 1 and 3-36 are pending. Support for the amendments is found in the specification and figures. No new matter has been added to the claims. Reexamination and reconsideration are requested in light of the accompanying amendments and remarks.

Support for the amendment is found in the specification and drawings. Particularly, claims 1, 9, and 29 are amended such that the filter material is formed in part from a plurality of filter particles "consisting of mesoporous activated carbon." Support for the amendment that the filter particles consist of mesoporous activated carbon is found in Example 1 and 2 on page 13, lines 26 through page 14, line 10 of the originally filed specification. Example 1 of the present application clearly show mesoporous activated carbon powder (Nuchar RGC) being used to form the filter particles (and not to form a coating on a filter particle), then mixed with a binder, placed in a mold with certain dimensions, heated, and cooled to form a filter material. (See also page 23, line 25 - page 24, line 24). Thus, Applicants submit that Example 1 provides ample support for the amendment the filter particle "consisting of mesoporous activated carbon.

Specification Objections

As shown in the Amendments to the Specification, Applicants have updated the status of the CROSS-REFERENCE section on page 1 of the specification as requested by the examiner. Thus, the objection is respectfully traversed, and reconsideration is requested.

Rejections Under 35 U.S.C. §103

Claims 1, 5-7, 12-14, 16-17, 19, 21, 22 and 26-27 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack (US 4,997,553) in view of Birdsong et al. (US

5,131,277) and Mitchell et al (WO 02/083266). Claims 3 and 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al, Mitchell et al as applied to claims 1 and 19 respectively and further in view of Koslow (US 6,630,016). Claim 4 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 1 above, and further in view of Sipos et al (US 5,371,221). Claim 8 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 1 above, and further in view of Baerg et al (US 3,670,892). Claims 9-10 and 24 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claims 1 and 19 above, and further in view of Deines et al (US 4,147,631) and Renn (US 3,268,444). Claims 11 and 25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claims 1 and 19 above, and further in view of Deines et al and Scavuzzo et al (US 3,333,703). Claim 15 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 1 above, and further in view of Kuh et al (US 4,681,677). Claim 18 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 1 above, and further in view of Cranshaw et al (US 6,117,319). Claim 23 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 19 above, and further in view of Coates et al (US 5,707,518). Claim 28 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al and Mitchell et al as applied to claim 19 above, and further in view of Wadsworth et al (US 6,123,837). Claims 29, 31 and 35-36 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al, Mitchell et al, Deines et al and Renn. Claim 30 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al, Mitchell et al, Deines et al and Renn as applied to claim 29 above, and further in view of Koslow. Claim 33 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al, Mitchell et al, Deines et al and Renn as applied to claim 29 above, and further in view of Scavuzzo et al. Claims 32 and 34 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clack in view of Birdsong et al,

Mitchell et al, Deines et al and Renn as applied to claim 29 above, and further in view of Coates et al.

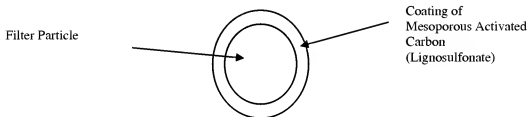
The Applicants respectfully traverse these rejections and submit that a prima facie case of obviousness under §103. In order to establish a prima facie case of obviousness under §103, the Examiner has the burden of showing, by reasoning or evidence, that: 1) there is some suggestion or motivation, either in the references themselves or in the knowledge available in the art, to modify that reference's teachings; 2) there is a reasonable expectation on the part of one of ordinary skill in the art that the modification or combination has a reasonable expectation of success; and 3) the prior art references (or references when combined) teach or suggest all the claim limitations. (Emphasis added, *MPEP §2145*).

The Examiner asserted that Mitchell discloses a filter material formed at least in part from a plurality of mesoporous activated carbon filter particles (see page 7, line 8 - page 8, line 1; page 13, lines 16-20); wherein the filter material has a F-BLR of greater than about 2 logs and a F-VLR of greater than about 1 log (see page 14, line 25 - page 15, line 8).

The Applicants point to the Examiner Interview with Examiner Kim on May 15, 2007 held in two commonly-assigned and co-pending applications (Appl. Serial Nos. 10/464,210 and 10/705,572; hereinafter "Related Applications"), which are related to the present application. (See enclosed Interview Summary). In the interview, the Applicants distinguished the inventions recited in the claims of the Related Applications from Mitchell by showing that Mitchell teaches a filter comprising filter particles comprising a mesoporous lignosulfonate, activated carbon coating applied to the filter particle. In contrast, the inventions in the Related Applications are directed to a filter formed in part from filter particles consisting of mesoporous activated carbon. Thus, Applicants submitted that Mitchell does not teach or suggest, singularly or in combination with other references, a filter formed in part from *filter particles consisting of mesoporous activated carbon*, wherein the *filter has a F-VLR* of greater than about 2 logs and/or a *F-BLR* of greater than about 1 log. The Examiner agreed.

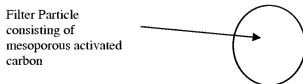
Similarly, Applicants submit that Mitchell teaches a filter material comprising a filter particle (e.g., a glass particle) and a lignosulfonate that is coated over the filter particle as shown below. Mitchell discloses carbonizing and activating the lignosulfonate coating to form a mesoporous activated lignosulfonate coating over the core filter particle. However, Mitchell is

silent regarding the actual filter particle being mesoporous activated carbon. Mitchell only teaches the coating being mesoporous activated carbon. For example, Mitchell discloses, "The sum of mesopore and macropore volumes of filter particles coated with an activated lignosulfonate is between 0.2 mL/g (g refers to **the mass of the carbon in the activated coating**) and about 2.2 mL/g." (Col. 8, lines 32-35). Thus, the intra-particle pore volumes taught in Mitchell are only for the carbon in the coating, and clearly do not teach or suggest intra-particle pore volume of a filter particle comprised entirely of mesoporous activated carbon as recited in the claims of the present invention.



In sharp contrast, claims 1, 19, and 29 of the present Application recite a filter comprising a novel and unobvious combination of a filter comprising a filter material, wherein the filter material comprises filter particles **consisting of mesoporous activated carbon**, and wherein the filter has a F-BLR of greater than about 2 logs (claim 1) or wherein the filter has a F-BLR of greater than about 2 logs and F-VLR of greater than about 1 log (claims 19 and 29).

Mitchell's filter particles coated with a mesoporous lignosulfonate are clearly different structures from the claimed filter particles consisting of mesoporous activated carbon. As set forth and shown above, Mitchell does not disclose, suggest, or motivate a filter material comprising filter particles consisting of mesoporous activated carbon as recited in claims 1, 19, and 29, only a mesoporous lignosulfonate coating that is applied over the filter particle.



Moreover, Applicants submit that neither Mitchell nor any of the other applied references, singularly or in combination, teach or suggest a filter comprising the combinations of a filter comprising a filter material, wherein the filter material comprises filter particles consisting of mesoporous activated carbon and wherein the filter has a F-BLR of greater than about 2 logs as recited in claim 1 or a filter comprising a filter material, wherein the filter material comprises filter particles consisting of mesoporous activated carbon and wherein the filter has a F-BLR of greater than about 2 logs and a F-VLR of greater than about 1 log as recited in claims 19 and 29.

Applicants further submit that none of the other references (Clack, Birdsong, Koslow, Sipos, Baerg, Deines, Renn, Scavuzzo, Kuh, Cranshaw, Coates, or Wadsworth), singularly or in combination with each other or with Mitchell teach or suggest the claimed combination of a filter comprising filter material, wherein the filter material comprises filter particles consisting of mesoporous activated carbon and wherein the filter has a F-BLR of greater than about 2 logs and/or a F-VLR of greater than about 1 log as recited in claims 1, 19, and 29. Specifically, Applicants submit that Koslow does teach activated carbon block filters made with activated carbon particles and a binder. However, Applicants submit that Koslow teaches a filter that is substantially different from the filter of the present invention. First, Koslow teaches a filter comprising an activated carbon filter structure which has a microporous **inter-particle** pore volume (Col. 2, lines 1-14, (active carbon particles having an average particle size of about 0.1 microns to about 5,000 microns and forming the treated active particles into a **microporous** structure having a mean flow path of less than about 2 microns). In contrast, independent claims 1, 19, and 29 recite a filter comprising a filter material, wherein the filter material comprises filter particles consisting of mesoporous activated carbon (**intra-particle** pore volume). No where does Koslow teach, suggest, or motivate mesoporous activated carbon (intra-particle pore volume), as defined in the present Application, to be used in forming a filter for removal of microorganisms, let alone a filter material formed from filter particles consisting of mesoporous activated carbon, wherein the filter has the recited F-BLR and/or F-VLR values as recited in claims 1, 19, and 29.

Second, Koslow teaches that the activated carbon filter particles include a **microbiological interception enhancing agent** coating in order for the filter to achieve the bacteria and virus removal levels taught. Koslow teaches the microbiological interception enhancing agent comprises both a **cationic material** that is first coated onto the activated carbon particles and then a second **biologically active metal** (e.g., silver) which is precipitated onto the cationic material in order to achieve its efficacy as a filter (col. 1, lines 52-60). In sharp contrast, Applicants' invention **requires neither an intermediate cationic polymer nor a biologically active metal** such as silver to achieve its F-BLR and/or F-VLR values. In other words, Applicants' claimed filter requires no such additional aids as taught by Koslow to achieve its claimed microorganism removal rates (i.e., F-BLR of greater than about 2 logs and/or F-VLR of greater than about 1 log), which is clearly not taught or suggested by Koslow. Therefore, Applicants respectfully submit that Koslow does not teach or suggest, explicitly or inherently, singularly or in combination with Mitchell, a filter comprising a filter material, wherein the filter material comprises filter *particles consisting of mesoporous activated carbon* and wherein the filter has a **F-BLR** of greater than about **2 logs** and/or a **F-VLR** of greater than about **1 log** as recited by Applicants' independent claims 1, 19, and 29.

Therefore, Applicants respectfully submit that none of the references, singularly or in combination, teach or suggest, explicitly or inherently, a filter comprising a filter material, wherein the filter material comprises filter particles consisting of mesoporous activated carbon and wherein the filter has a **F-BLR** of greater than about **2 logs** and/or a **F-VLR** of greater than about **1 log** as recited by Applicants' independent claims 1, 19, and 29. Accordingly, Applicants respectfully request the rejections of claims 1, 19, and 29 under 35 U.S.C. 103 be withdrawn. As claims 3-18, 20-28, and 30-36 depend from claims 1, 19, or 29, Applicants respectfully request the rejections of these claims under 35 U.S.C. 103 be withdrawn as well.

CONCLUSION

Applicants respectfully submit that the present application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

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Respectfully submitted,
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